



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/781,421

02/18/2004

Colleen Legzdins

2269.029US1

3051

21186

7590

03/14/2008

SCHWEGMAN, LUNDBERG & WOESSNER, P.A.

P.O. BOX 2938

MINNEAPOLIS, MN 55402

EXAMINER

TALBOT, BRIAN K

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

03/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/781,421 | Applicant(s) LEGZDINS ET AL. | |
| | Examiner Brian K. Talbot | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 and 22-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 and 22-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. The amendment filed 12/21/07 has been considered and entered. Claims 20-21 have been canceled. Claims 22-28 have been added. Claims 1-19 and 22-28 remain in the application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. In light of the amendment filed 12/21/07, the 35 USC 103 rejections have been withdrawn and the following rejections have been necessitated by the amendment.

Claim Rejections - 35 USC § 103

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
5. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knights et al. (2004/0157110) in combination El-Sayed (6,090,858) in combination with Womelsdorf (2002/0149002) in combination with Asakawa et al (2003/0222048).

Knights et al. (2004/0157110) teaches a supported catalyst for the anode of a voltage reversal tolerant fuel cell. The solid polymer fuels cell series can result in voltage reversals. In order to pass current, reactions other than fuel oxidation may take place at the anode (abstract). Electrodes for MEA can be prepared by first applying a sublayer if desired to a suitable substrate and then applying the catalyst layer onto the sublayer. These layers can be applied in the form of slurries or inks which contain particulates and dissolved solids mixed in a suitable liquid carrier. The liquid carrier is evaporated off to leave a layer of particulates and dispersed solids ([0011]). The fuel cell can be connected to a load ([0012]). Knights et al. (2004/0157110) teaches the coating is applied to a porous substrate and that the coating enters micropores of greater than 100 nanometers (.1 microns).

Knights et al. (2004/0157110) fails to teach the particular claimed nano-particle dispersion.

El-Sayed (6,090,858) discloses a method for the synthesis of colloidal metal nanoparticles where in ratio of concentration of a capping material to that of the metal ions in a solvent is manipulated to produce the desired nanoparticles (column 1, lines 66-67; column 2, lines 1-4). Degree of polymerization and concentration of the stabilizing polymer i.e. capping material used to produce colloidal particles influence the size distribution, stability of these colloidal particles. For example, higher ratio of capping material to metal component produces smaller gold particles (column 1, lines 47-53). The ratio of capping material to metal ions is 1:1, 2.5:1 and 5:1 (column 3, lines 17-20) and reads on the ratio of charged soluble polymer to metal component of claim 1. In the preferred embodiment, water is added to make 8×10^5 M solution of the K_2PtCl_4 salt. To this is added 0.1 M sodium polyacrylate as the capping material

Art Unit: 1792

(column 3, lines 41-51) and read on weight percentages of charged soluble polymer and metal component of claim 1. The concentration of K_2PtCl_4 and sodium polyacrylate solutions is low and reads on a large weight percentage of carrier such as water of claim 1. The synthesis of colloidal particles includes providing a solution of K_2PtCl_4 in water by maintaining the vessel temperature at 25°C to which is added 0.1 M solution of sodium polyacrylate (abstract) and reads on the room temperature of claim 13. The average size of these nanoparticles range from 0.5 to 18 nm (column 5, lines 1-5). The nanoparticles are prepared by the standard method whereby a solution of a metal salt and water is prepared in a reaction vessel to which a capping material such as sodium polyacrylate, sodium monoacrylate is added (column 2, lines 8-12). The sodium polyacrylate reads on 100% substitution of the claim 1.

El-Sayed (6,090,858) fails to teach or is silent with respect to molecular weight of the polymer being less than 25,000 amu.

Womelsdorf (2002/0149002) teaches an aqueous dispersion of Zn oxide nanoparticles consisting of a stabilizer such as sodium polyacrylate which has a mean molecular weight of 5100 (paragraph 0022) and reads on the molecular weight of charged soluble polymer of claims 1 and 3.

Therefore, it would have been obvious to one skilled in the art at the time invention was made to use sodium polyacrylate with a mean molecular weight of 5100 in the colloidal nanoparticle dispersion of El-Sayed (6,090,858) with the expectation of achieving similar success and to have utilized the nanoparticle dispersion as a catalyst and/or electrode dispersion in Knights et al. (2004/0157110) process.

Knights et al. (2004/0157110) in combination El-Sayed (6,090,858) in combination with Womelsdorf (2002/0149002) fail to recite forming features on the substrate on which the electrode is formed.

Asakawa et al (2003/0222048) discloses coating a micro-structured object having features formed thereon, wherein each of the features have a dimension of between 50 nm and 200 microns (para 0001).

It would have been obvious to one with ordinary skill in the art to include coating a micro-structured object having features formed thereon, wherein each of the features have a dimension of between 50 nm and 200 microns because Asakawa et al (2003/0222048) teaches need in the electronics art for micro-structured objects (para 0002).

Claims 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knights et al. (2004/0157110) in combination El-Sayed (6,090,858) in combination with Womelsdorf (2002/0149002) in combination with Asakawa et al (2003/0222048) still further in combination with Biebuyck et al. (6,326,058).

Features detailed above concerning Knights et al. (2004/0157110) in combination El-Sayed (6,090,858) in combination with Womelsdorf (2002/0149002) in combination with Asakawa et al (2003/0222048) are incorporated here.

Knights et al. (2004/0157110) in combination El-Sayed (6,090,858) in combination with Womelsdorf (2002/0149002) in combination with Asakawa et al (2003/0222048) fail to teach rendering the external surface of the microstructure to be hydrophobic.

Biebuyck et al. (6,326,058) teaches a device for patterning a substrate with patterning cavities. Biebuyck et al. (6,326,058) teaches when filling conduits with liquid material it is

necessary to make the walls hydrophilic and the outer/exterior surfaces hydrophobic so as to make it energy favorable for the fluid to remain in the desired micro-channels or chambers.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified Knights et al. (2004/0157110) in combination El-Sayed (6,090,858) in combination with Womelsdorf (2002/0149002) in combination with Asakawa et al (2003/0222048) by treating the exterior of the holes to be hydrophobic so as to assure the coating fills the holes as evidenced by Biebuyck et al. (6,326,058) with the advantage of concentrating the coating material and avoiding a subsequent removing step which would be required.

Response to Amendment

6. Applicant's arguments with respect to claims 1-19 and 22-28 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argued Knights et al. (2004/0157110) teaches forming the coating on a substrate having pores but not filling the pores with the coating and therefore teaches away from the present invention.

The Examiner agrees in part. While the section pointed out by Applicant ([0058]) of Knights et al. (2004/0157110) teaches the coating is applied to a porous substrate and that the coating does not enter micropores of less than 100 nanometers (.1 microns), it is clear that the porous support includes micropores greater than 100 nanometers (.1 microns) and that these

Art Unit: 1792

pores would indeed be filling with catalyst and electrolyte. Furthermore, the instant claims (6,16,17,24) recite microstructures ranging from 25 nanometers to 200 microns which would include the micropores of Knights et al. (2004/0157110) and therefore meet the claimed limitation. In addition, the rejection is based upon a combination including Asakawa et al (2003/0222048) which clearly teaches a microstructure having the claimed feature size and coating therein. The test of obviousness is not express suggestion of the claimed invention in any or all references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them. *In re Rosselet*, 347 F.2d 847, 146 USPQ 183 (CCPA 1965); *In re Hedges*, 783 F.2d 1038. In this case, the combination of references clearly teach the claimed invention of microstructures being filled with electrode material.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1792

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 8AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

//Brian K Talbot//
Primary Examiner, Art Unit 1792

BKT

Application/Control Number: 10/781,421
Art Unit: 1792

Page 9